RUDRAPRASAD CONSULTANTS

NAME OF WORK: **Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, warakanagara and Surrounding area in Ward No.05**

DETAILED PROJECT REPORT

SUBMITTED TO B.B.M.P, BANGALORE

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BRUHAT BENGALURU MAHANAGARA PALIKE

NAME OF WORK: Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05

DETAIL PROJECT REPORT

Rudraprasad consultants

No.3, 7th Main,

Malleswaram Bengaluru-560003

Executive Engineer

Byatarayanapura Division

Bengaluru

Table of Contents

1.	**INTRODUCTION**	1
1.1	General	4
1.2	Topography	4
1.3	Project Objective	5
1.4	Outline of the project	6
2.	**DESCRIPTION OF PROJECT ROADS**	7
2.1. General		8
2.2. Existing Project Road		8
	2.2.1. Terrain	8
	2.2.2. Alignment	8
	2.2.3. Climate	8
	2.2.4. Carriage Way Width	9
	2.2.5. Pavement Condition	10
	2.2.6 Land Use along the Project Highway	10
2.3	Traffic Flow Conditions	10
2.4	Cross Drainage Structures and Side Drains	10
2.5	Utilities	11
2.6	Trees	12
3.	**CONCLUSIONS**	13
3.1	General	13
	3.1.1. Geometric Improvements	13
	3.1.2. Strengthening of Existing Pavements	14
3.2.	Improvement Proposal for Carriageway	14
3.3.	Improvement Proposal for Side Drains	15
3.4.	Improvements Related to utility, Road Furniture and appurtenances	

4	**COST ESTIMATES**	16
4.1	Detailed Cost Estimate	17
4.2	General	17
4.3	Basic rates	17
4.4	Utility Relocation	17
4.5	Project Management and Quality Control	17
4.6	Project Cost	17
5.	**DETAILED ESTIMATES**	
6.	**DRAFT TENDER SCHEDULE**	
7.	**BILL OF QUANTITIES**	

ANNEXURES

- **TYPICAL CROSS SECTION**
- **ROAD PHOTOGRAPHS**
- **WARD MAP**
- **KEY MAP**

INTRODUCTION

CHAPTER – 1

INTRODUCTION

Detailed Project Report

1.1 General

India's pride, Bengaluru is nearly 500 years old and has grown from a small time settlement when KempeGowda, the architect of Bengaluru, built a mud fort in 1537 and his son marked the city boundaries by erecting four watch towers. Bangalore is the capital and the largest city of Karnataka. It is also called "Garden City" for its beautiful gardens, flowers and trees which flourish in each and every street. Bangalore is India's third largest city, fifth most populous city and fifth-most populous urban agglomeration. The majority of the city of Bangalore lies in the Bangalore Urban district of Karnataka and the surrounding rural areas are a part of the Bangalore Rural district. In recent days Bangalore has transformed itself from a "pensioners' paradise" to a modern thriving "cosmopolitan metropolis". Today Bengaluru has grown well beyond those four towers into a sprawling metropolis of more than 6 million people and is referred to as the "Silicon Valley" of India.

As a large and growing metropolis, Bangalore is home to many well-recognized colleges and research institutions in India. Numerous public sector heavy industries, software companies, aerospace, telecommunications, and defence organizations are located in the city. Bangalore is also well known as a hub for India's Information Technology sector. It is among the top 10 preferred entrepreneurial locations in the world. Bangalore is a major economic and cultural hub and the second fastest growing major metropolis in India. Today 35 percent of India's software export is done at Bangalore. Rapid population growth in Bangalore was brought about by the IT and other associated industries, leading to an increase in the population to about 1.5 million, with an annual growth rate of 10-14%.every year.

Bangalore today is obviously one of the most sought after cities in the country with the rapid growth in the IT industry and other associated industries the rise in the number of job opportunities in the city. With the rising population in the city there is also a corresponding increase in the number of vehicles in the city. Bangalore's vehicular traffic has increased manifold, with 1.6 million registered vehicles in the city — the second highest for an Indian city, after New Delhi. Bangalore in particular is that there is very little scope for expansion of

roads and the need to use existing roads for smoothmovement of vehicles is even more pronounced. It thus becomes mandatory for the administration to ensure better parking facilities. With the increase in population and the expansion of the city, the problem of connectivity of the populace has arisen. Quite obviously personalized modes of transport have grown at a tremendous rate and two wheelers along with the cars. The maintenance and construction of roads to address the growing traffic in the city has been a challenge to the BDA and the BBMP. Development of the city road infrastructure has revolved around imposing one-way traffic in certain areas, improving traffic flow in junctions, constructing ring roads, bridges, flyovers and other grade separators.

Bangalore's road network exceeds 3,000 km (1,800 mi) and consists of ring roads, arterial roads, sub-arterial roads and residential streets. The city road network is mainly radial, converging in the centre. Many of Bangalore's erstwhile colonial and town streets were developed into commercial and entertainment areas after independence. The B.V.K Iyengar Road became the retail hub of Bangalore, while MG Road, Commercial Street and Brigade Road became important shopping, recreation and corporate areas. But for MG Road, other roads in and around the erstwhile Parade Ground remain narrow, winding roads. The unplanned nature of growth in the city resulted in massive traffic gridlocks that the municipality attempted to ease by constructing a flyover system and by imposing one-way traffic systems. Some of the flyovers and one-ways mitigated the traffic situation moderately but were unable to adequately address the disproportionate growth of city traffic. Some of the flyovers and one-ways mitigated the traffic situation moderately; however the volume of traffic continues to grow at an annual rate of between 7- 10%. The Outer Ring Road was initially constructed to ease truck congestion in the city; however the growth of suburbs reduced the positive impact of the ring road. BDA is laying additional lanes on many of the major roads around Bangalore. The Peripheral Ring Road is designed to be concentric to the Outer Ring Road and covers 108.9 km. The Hosur Road, which connects Bangalore to the Electronics City, is heavily congested and is part of the National Highway (NH7), therefore witnesses' heavy truck traffic as well.

Export Promotional Industrial Park (EPIP) in Bangalore is the place which entrepreneurs love to be identified with. EPIP is in the just next door of M/s ITPL, an internationally acclaimed technology park promoted by KIADB with TATAs and Singapore consortium of industries.

This park comes with state-of-the-art infrastructure facilities. Following are the few of many features of this prestigious location

- Location in unpolluted, lush green atmosphere, just 17 Kms. from the heart of the city and 9 Kms. from Bangalore Airport.
- Total extent of developed land is 547 acres with well-laid asphalted roads & drainage systems.
- Assured water supply & dedicated power lines with Sodium Vapor street lighting.
- KTPO Exhibition Complex coming up in the area. Hospital with ultra modern facilities and well-equipped inland container depots.
- Well connected with public transport with host of secondary infrastructure facilities like telephones, Posts & Telegraph, Banks, ATMs, Convention center. Cafeterias, Travel operators.

EPIPs are the destination for industrial units who have plans to export at least 33% of their output in value offshore. These parks come with well-planned infrastructure, which is hallmark of KIADB's service. These parks are established with the sanction of Union Govt, of India to give impetus to growth of exports in the state. Government of Karnataka offers host of incentives and concessions to export oriented units.

The Bruhat Bengaluru Mahanagara Palike (BBMP, Greater Bangalore Municipal Corporation vide Government of Karnataka Notification no. UDD 92 MNY dt: 2.11.2006) is in charge of the civic administration of the city. It was formed in 2007 by merging 100 wards of the erstwhile Bangalore Mahanagara Palike, with seven neighboring City Municipal Councils (Rajarajeshwari Nagara, Dasarahalli, Bommanahalli, Krishnarajapuram, Mahadevapura, Byatarayanapura and Yelahanka), one Town Municipal Council (Kengeri) and 111 villages around Bangalore. The BBMP Is run by a city council composed of 250 members, including 198 corporators representing each of the wards of the city. The BBMP works with the Bangalore Development Authority (BDA) and the Agenda for Bengaluru Infrastructure and Development Task Force (ABIDe) to design and implement civic projects.

The BBMP has taken up an ambitious plan to upgrade Arterial & Sub Arterial Road network in these newly added areas of BBMP and Development, maintenance and management of high quality network in EPIP zone roads at Mahadevapura Zone, where the traffic intensity

has increased significantly and to augment the capacity for safe, efficient and free flow of traffic. Roads in and around EPIP zones are being upgraded to arterial road standards which will result in enormous increase in the traffic. Tech city, a preferred choice of many global corporations to position their businesses. It has indeed been a challenge to the government agencies including the urban local bodies to meet up with these unprecedented demands and challenges of the global companies and its citizens demanding international class 'citizen services'.

The project consists of improvements to roads and drains, in wards 05 of Byatarayanapura Sub Division Constituency, which includes 9 roads. The existing roads need to be improved, since they are not in good condition and to avoid inconvenience to people living in these wards. The total length of all roads in ward05 is 1681.50 m (1681.50Km). The ward maps in which the respective roads are highlighted are enclosed with this report.

1.2 Topography

Bangalore is situated in the southeast of Karnataka, at an average elevation of 920m above mean sea level. It is positioned at 12.97°N, 77.56°E and covers an area of 2, 190 sq.km. Bangalore Urban District borders with Kolar District in the northeast, Tumkur District in the northwest, Mandya District in the southwest, Chamarajanagar District in the south and the neighboring state of Tamil Nadu in the southeast. The Bangalore Urban District is divided into three taluks; Bangalore North, Bangalore South, and Anekal. The Bangalore North taluk is a relatively level plateau, while the Bangalore South taluk has an uneven landscape with intermingling hills and valleys.

1.3 Project objective

- The main objective of the study is to establish the technical & economical viability of the project roads by rehabilitation, strengthening, asphalting, concrete including culverts and improvements of side drains of the existing roads.
- The detailed project study includes submission of the detailed project report for the project as per standards.

1.4 Outline of the project

The consultant is required to conduct various engineering Surveys, Investigate, Carry out Detailed Design and Viability of the project. **Prepare Detailed Project Report**, based on Detailed Design and Bill of Quantities.

CHAPTER - 2

DESCRIPTION OF PROJECT ROADS

2.1 General

The project consists of bad roads in Ward No.05, Byatarayanapura Sub Division Constituency, which includes 9 roads in. The existing roads need to be improved since there are formation of Cracks, Rutting and Potholes which are a hindrance to the free movement of traffic, in turn causing inconvenience to the people of the respective wards. The total length of all roads in Ward No.05 is 1681.50 m (1.681Km), Majority of roads pass through residential and commercial area. Below are the lists of the bad roads in their respective wards.

- **List of Roads**
- **List of Roads in Ward No.05 (Dwarakanagara)**
  - Dwarakanagara - 1St Main Road
  - Dwarakanagara - 1st Main 1st Cross Road
  - Dwarakanagara - 1st Main 2 Cross Road
  - Dwarakanagara – 2 nd main Road
- **List of Roads in Ward No. 05 (Babanagara)**
  - Babanagara - 2nd Main Road
  - Babanagara - 4th main Road
  - Babanagara - 5th main Road
  - Babanagara - 6th main Road
  - Babanagara - 1st cross Road
  - Babanagara - cross Road

2.2 Existing project roads

2.2.1 Terrain

Terrain is classified by general slope of the country across the alignment, based on this criterion majority of the project roads pass through Plain terrain.

2.2.2 Alignment

The existing roads have the carriage widths varying from 4.8m to 5.8m and the existing gradients of the project roads are within acceptable limits as per IRC: 86. Table 1 shows the list of project roads with their carriage way widths.

2.2.3 Climate

Due to its elevation, Bangalore enjoys a pleasant climate throughout the year, with temperatures ranging between 33°C and 16°C, with an average of 24°C. The summer heat is moderated by occasional thunderstorms and squalls. Bangalore receives adequate rainfall of about 860 mm from the Northeast Monsoon as well as the Southwest Monsoon. The wettest months are August, September and October.

2.2.4 Carriageway Width

The existing carriageway width varies from 4.8 m to 5.8m. Details of carriageway width are as shown in Table 2.1 below,

Table 2.1 - LIST OF ROADS WITH THEIR CARRIAGE WAY WIDTHS

Sl No	Name of the Road	Carriage Way Width in m
Ward No.05		
Dwarakanagara		
1	1St Main Road	5.4
2	1st Main 1st Cross Road	4.8
3	1st Main 2 Cross Road	5.55
4	2nd main Road	5.7
Babanagara		
5	2nd Main	5.2
6	4th main	5.2
7	5th main	5.5
8	6th main	5.8
9	1st cross	5.3

The existing pavement conditions are analyzed based on visual inspection as per IRC 81-1997 Table -1. The Roads as per the Visual Inspection were found to be in Good to Poor condition. This may be due to improper material in subgrade, compaction or movement of heavily loaded trucks. The summaries of pavement condition obtained by visual inspection are listed in Table 2.2 below.

TABLE 2.2: PAVEMENT CLASSIFICATION BASED ON VISUAL INSPECTION

Sl.No	Name of the Road	Road Condition
	Dwarakanagara	
1	1St Main Road	satisfactory
2	1st Main 1st Cross Road	poor
3	1st Main 2 Cross Road	poor
4	2nd main Road	satisfactory
	Babanagara	
5	2nd Main	satisfactory
6	4th main	Poor
7	5th main	Poor
8	6th main	satisfactory
9	1st cross	satisfactory

2.2.6 Land Use along the project highway

Land use along majority of roads is predominantly for built up area. The settlements are used for residential and commercial purposes.

`2.3 Traffic flow conditions

Traffic on these project roads is of mixed type. Majority of roads only carry passenger vehicle most of the time, and there are also commercial vehicles ply on some roads. Commercial vehicles include 2-axle and 3-axle trucks and LCVs.

The intensity of traffic on this stretch is likely increase in future, the reason being:

- The Bangalore Mahanagara Palike became Bruhat Bangalore Mahanagara Palike after inclusion of 7 CMC, 1TMC & 111 Villages adjoining to the CMC areas vide Government of Karnataka Notification No. UDD 92 MNY 2006 dated 02.11.2006. To provide better transport facility, to improve the quality of urban civic services better roads are needed. At present the existing roads in these newly added areas are narrow without proper Drainage, Footpath, and Culverts etc. The BBMP has taken up an ambitious plan to upgrade Arterial & Sub Arterial Road network in these newly added areas of BBMP in view of providing better infrastructure.
- Roads in and around EPIP zones are being upgraded to arterial road standards which will result in enormous increase in the traffic.
- The number of commercial and residential plots in the given area is high.
- Rising traffic congestion is one of the key issues in the City. Though the length of roads available is good, the problem lies with the restricted widths.

2.4 Cross Drainage Structures and Side Drains

There are no major CD structures along the project road except for the cross roads. The condition of the existing CD structures is good.

2.5 Utilities

- **HT Lines**

  HT lines do not cross along the project roads
- **Light Poles**

  Large numbers of light poles are present along the project roads in regular intervals

2.6 Trees

The project roads consist of trees beside the carriageway at regular intervals. Also tree pits are constructed for all the trees on either side of the roads for watering the trees. Curb stones are laid all round the tree pits for protection

CONCLUSION

CHAPTER - 3

CONCLUSIONS

3.1 General

The primary data collected from the site provides a clear picture of the site conditions, and also gives us a good insight about the deficiencies and the scope for improvements. The primary data coupled with the good engineering expertise lead us in giving apt and economical recommendations for the improvements. A budget of Rs. 4,00,00,000.00/- (Rs. Four Crore Only) has been allocated for this project. Hence, the provisions of items made in the cost estimate are in consensus with the allocated budget. The improvement proposal includes the following:

3.1.1. Geometric Improvements:

- Improvements of existing carriageway
- Improvements to cross sectional elements
- Improvements to horizontal alignment
- Improvements to longitudinal profile

3.1.2. Strengthening of Existing Pavements:

- Pavement Overlay design
- Road Drainage
- Road Furniture and Appurtenances
- Pedestrian Facilities
- Aesthetics

The summary of improvement proposals along the project roads in Ward no.05 Conforming to Design Standards with all the Relevant Details such as Length and Width of existing roads, Plans and Construction Costs has been prepared. The details of improvement proposals are discussed in subsequent sections.

3.2. Improvement proposal for Carriageway

Since the majority of the roads are Arterial and sub-arterial roads where the Traffic intensity is less than 10msa, Table 3.1 shows the improvement proposals and pavement composition for the existing roads.

TABLE 3.1: : IMPROVEMENT PROPOSAL AND PAVEMENT CONDITION DETAILS

FLEXIBLE PAVEMENT

Sl No	Name of the Road	BC
Ward No.05		
Dwarakanagara		
1	1St Main Road	40
2	1st Main 1st Cross Road	40
3	1st Main 2 Cross Road	40
4	2nd main Road	40
Babanagara		
5	2nd Main	40
6	4th main	40
7	5th main	40
8	6th main	40
9	1st cross	40

3.3. Improvement Proposal for Side Drains

Adequate drainage is a primary requirement for maintaining the structural soundness and functional efficiency of a road in addition to preserving the valuable road assets created. Pavement structure including subgrade must be protected from any ingress of water, otherwise over a period of time it may weaken the sub grade by saturating it and cause distress in the pavement structure. Hence, rapid dispersal of water from pavement and sub

grade is a basic consideration in road design. Also, quick drainage takes away the water from pavement's surface and reduces chances of skidding of vehicles.

The requirements of road drainage are essentially based on IRC: SP-42-" Guidelines on Road Drainage" and IRC:SP-50 -"Guidelines on Urban Drainage". Camber of 3.0 is provided for the carriageway. For longitudinal drains, a minimum longitudinal gradient of 0.3 percent shall be ensured for satisfactory drainage.

3.4. Improvements Related to Utility, Road Furniture and Appurtenances

Utility and Importance of the Road are greatly enhanced by installing Road Furniture and Appurtenances at appropriate locations along the Project Road, which ensures Improved Road Safety. Planning and Design of Road Furniture and Appurtenances are as per the Guidelines stipulated in IRC. Detailing of each of these Components has been done so that to integrate the same with the Road Improvement Scheme.

COST ESTIMATES

CHAPTER - 4

COST ESTIMATES

4.1. Detailed Cost Estimate

Detailed cost estimate for Various works listed in Ward no.5 has been worked out based on detailed engineering design.

4.2. General

Cost Estimate is an important part of the DPR as it provides vital input to financial evaluation of the project. The cost estimates have been prepared for strengthening of the existing road, repairs and improvements to longitudinal drains, road furniture and appurtenances.

4.3. Basic rates

As part of Detailed Project Report, Rate Analysis of each of the item has been prepared by adopting PW, P & IWTD SR 2018-19, Bangalore Circle. The rates as given in PW, P & IWTD SR are to be enhanced by 6% for additional weight age for the works to be executed under extra ordinary conditions for Bangalore Metropolitan Limits. Items not covered in NHSR / PW, P & IWTD SR have been based on market rates.

4.4. Utility Relocation

Provision of 1.5% of Construction cost is made in the cost estimated for raising and or shifting electric supply lines, telephone lines, OFC lines and other utilities.

4.5. Project Management and Quality Control

Provision of 2.0% of Construction Cost has been made towards Cost of DPR Preparation,PMC and Proof Checking.

4.6. Project Cost

The total project cost for the **Preparation of DPR for Improvements to Roads and RCC Drains at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05 is** 4,00,00,000 and the Detailed Cost Estimate is enclosed.

Sl No	Description of work	Unit	Mesurement No.	L	B	D	Qty	Rate	Amount
	1st cross	Sqm	2.00	240.00	0.10		48.00		
	Basic rate	429.00							
	Area weightage 6%	25.74							
	Sub Total	454.74							
	Total						336.30	454.74	152929.06
								Grand Total	33498312.62
								DPR Charges (1% of Estimated cost)	400000.00
								Project management And Consultancy Charges(1% of Estimated cost)	400000.00
								GST Charges (12% of Estimated cost)	4019797.51
								Tender premium 5% of Estimated cost	1674915.63
								Miscellenious and rounding	6974.23
								Total Amount	40000000.00
								RUPEES FOUR CRORE ONLY	

CERTIFICATE:

1) The work spot has been inspected and found to be necessary
2) The work spot comes under B.B.M.P
3) The provisions made in the estimate are necessary and minimum
4) The estimate is based on C.S.R of 2018-2019, Issue rates and Data Rates.

Assistant Engineer
BBMP

Assistant Executive Engineer
BBMP

Executive Engineer
BBMP
22/09

ADMINISTRATIVE APPROVAL
Accorded For Rs. 400.00 Lakhs only
Head of A/c. P3297
Div. Ref. No. 40 Date 14/09/2020
AE 14/09
EE(BTP) 14/09

Technical Sanction
Accorded For Rs 400.00 Lakhs only
Head of A/C. P3297
CER NO : 07 Dt: 22.05.2020
TA CE (YNK)

DRAFT TENDER SCHEDULE

BRUHAT BANGALORE MAHANAGARA PALIKE

NAME OF WORK:-Improvements to Roads and RCC Drain at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05

DRAFT TENDER SCHEDULE

Item No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
1	Dismantling of existing structures like culverts,bridges, retaining walls and other structure comprising of masonry, cementconcrete, wood work, steel work, including T&P and scaffolding wherevernecessary, sorting the dismantled material, disposal of unserviceablematerial and stacking the serviceable material with all liftsas per specifications. iii)Dismantling Stone Masonry. B. Rubble Stone masonry in cement mortar.complete as per specifications and directions of the Engineer in charge.	Cum	19.26	441.86	Rupees Four Hundred Forty One and Eighty Six Paise Only
2	Earthwork excavation by manual means for roads, drains & similar works in ordinary soil excavated surface levelled and sides neatly dressed, the disposed earth to be levelled neatly after breaking of clods complete as per specifications and directions of the Engineer in charge.5km lead= 57+2.0x1.28x5 =69.80	Cum	3730.58	207.60	Rupees Two Hundred Seven and Sixty Paise Only
3	Providing and laying Plain cement concrete of mix1:3:6 with OPC cement @ 220kgs, with crushed 40mm and down size graded granite metal coarse aggregates @0.89cum and fine aggregates @ 0.46cum, in foundation mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days Including cost of materials,labour, HOM curing form work, Scaffolding and Centering complete as per Specification and directions of the Engineer in charge	Cum	554.85	5421.90	Rupees Five Thousand Four Hundred Twenty One and Ninety Paise Only
4	Providing laying plain/ reinforced cement concrete for side Drains Using M20 nominal mix Concrete with OPC at 300kgs.With 20mm and Down size granite metal coarse aggregate at 0.69cum and fine aggregate at 0.43cum Machne mixed, well compacted for wall and Bottom including centering shuttering,cost of materials,HOM of Machinery,Curing Etc.,Complete Excluding cost of Steel as per morth MORTH specification No. 1500, 1700, 2200. Including Cost of material, Labour, HOM complete as per Specification-WALL & Bottom thickness 15Cm.complete as per Specification and directions of the Engineer in charge	Cum	1139.51	7070.20	Rupees Seven Thousand Seventy and Twenty Paise Only
5	Providing T.M.T bars Fe 500 steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and / or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery. MORTH Specification NO.1600&2200 ,complete as per Specification and directions of the Engineer in charge	tonne	80.44	72326.98	Rupees Seventy Two Thousand Three Hundred Twenty Six and Ninety Eight Paise Only

m No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
13	.Cleaning the existing WBM Road surface including removing of binding materials and other foreign matter with wire brushes and small picks sweeping with brooms or soft brushes and finally dusting with old gunny bags and bar or compressed air to receive bituminous treatment including cost of all materials, labhour, HOM of machineriescomplete as per Specification and directions of the Engineer in charge	Sqm	4006.80	22.26	Rupees Twenty Two and Twenty Six Paise Only
14	Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and spraying primer at the rate of 0.60 kg / sqm using mechanical meanscomplete as per Specification and directions of the Engineer in charge	Sqm	4868.72	28.62	Rupees Twenty Eight and Sixty Two Paise Only
15	. Providing and laying dense graded bituminous macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to work site, laying to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications Clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with Mechanical paver Gr-II (50 mm to 75 mm) with 4.5 % VG-30 Bitumen, complete as per Specification and directions of the Engineer in charge	Cum	244.64	6597.44	Rupees Six Thousand Five Hundred Ninety Seven and Forty Four Paise Only
16	.Cleaning the existing black topped surface with brooms,soft brushes and finally dusting with old gunny bags and/or compressed air to receive bituminous treatment including cost of all materials,labhour, HOM of machineries complete as per Specification and directions of the Engineer in charge	Sqm	9013.15	5.30	Rupees Five and Thirty Paise Only
17	Providing and applying tack coat using 80/100 grade bitumen(VG10) on the prepared black topped surfaces at 2.5 kg per 10 sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of all materials, labour, HOM complete as per Specification and directions of the Engineer in charge	Sqm	9013.15	12.72	Rupees Twelve and Seventy Two Paise Only
18	Providing and laying Bituminous Concrete 40 mm thick with hot mix plant, using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment , rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications.Clause 507 of MORTH V revision as per IRC SP-53-2015 - using 40-60 TPH capacity HMP with mechanical Paver, Gr-II (30-45mm) with 5.4 % of modified bitumen binder consisting of 4.97% VG- 30 bitumen (60/70 grade) 0.43% Plastomeric Thermoplastics (Waste plastic Additive) complete as per Specification and directions of the Engineer in charge	Cum	360.42	7753.90	Rupees Seven Thousand Seven Hundred Fifty Three and Ninety Paise Only

em No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
19	Road Marking with Hot Applied Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface/ Concrete Surface: Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 standards specified. The finished surface to be level, uniform and free from streaks and holes complete as per Specification and directions of the Engineer in charge	Sqm	336.30	454.74	Rupees Four Hundred Fifty Four and Seventy Four Paise Only

Executive Engineer
BBMP

"DTL Approved"

ಮುಖ್ಯ ಅಭಿಯಂತರರು
ಯಲಹಂಕ ವಲಯ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

BILL OF QUANTITIES

BRUHAT BANGALORE MAHANAGARA PALIKE

NAME OF WORK:-Improvements to Roads and RCC Drain at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05

BILL OF QUANTITIES

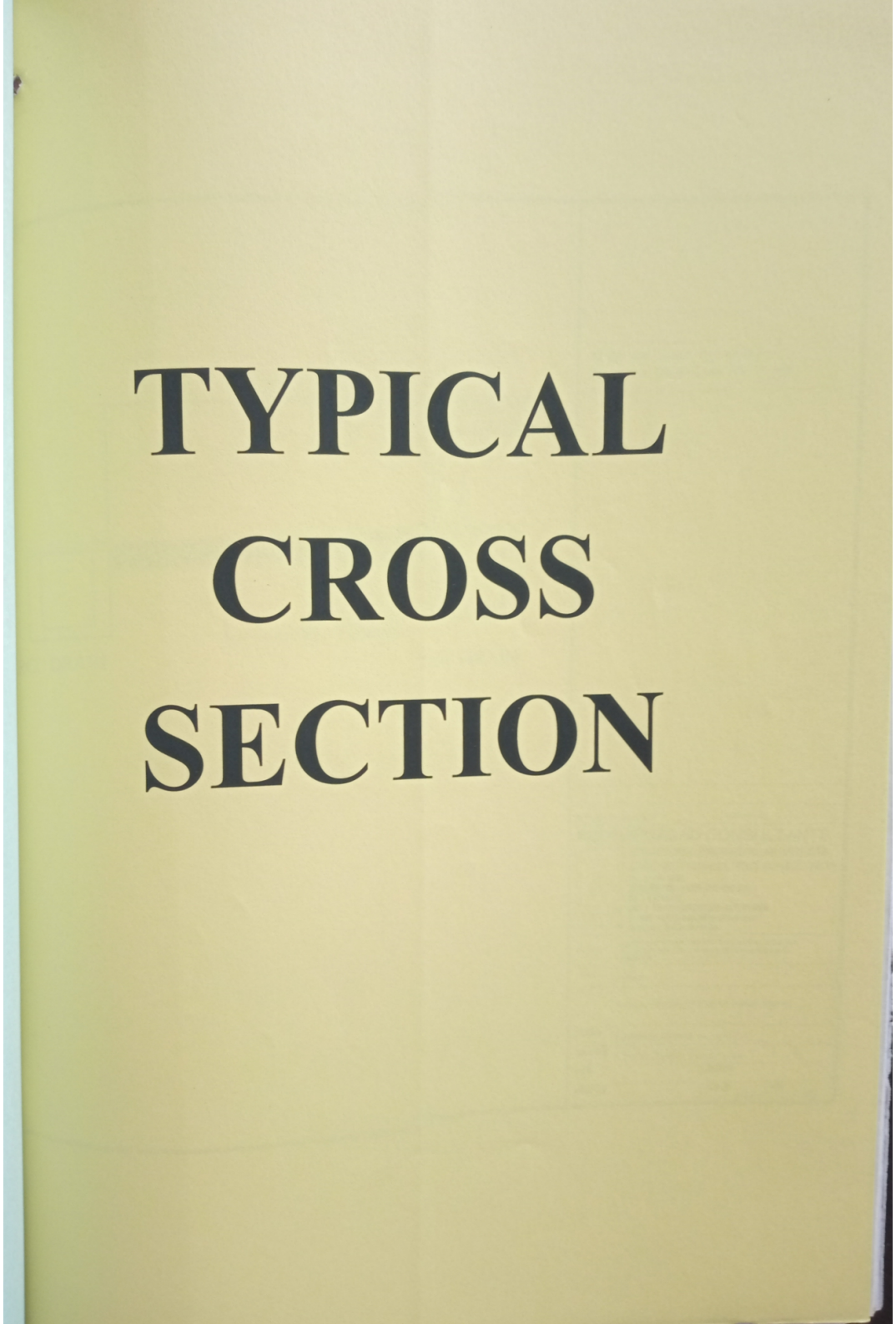
Item No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
1	Dismantling of existing structures like culverts,bridges, retaining walls and other structure comprising of masonry, cementconcrete, wood work, steel work, including T&P and scaffolding whereverenecessary, sorting the dismantled material, disposal of unserviceablematerial and stacking the serviceable material with all liftsas per specifications. iii)Dismantling Stone Masonry. B. Rubble Stone masonry	Cum	19.26		
2	Earthwork excavation by manual means for roads, drains & similar works in ordinary soil excavated surface levelled and sides neatly dressed, the disposed earth to be levelled neatly after breaking of clods complete as per specifications and directions of the Engineer in charge.5km lead= 57+2.0x1.28x5 =69.80	Cum	3730.58		
3	Providing and laying Plain cement concrete of mix1:3:6 with OPC cement @ 220kgs, with crushed 40mm and down size graded granite metal coarse aggregates @0.89cum and fine aggregates @ 0.46cum, in foundation mechanically mixed, placed in foundation and compacted by vibration including curing for 14 days Including cost of materials,labour, HOM curing form work, Scaffolding and Centering complete as per Specification and directions of the Engineer in charge	Cum	554.85		
4	Providing laying plain/ reinforced cement concrete for side Drains Using M20 nominal mix Concrete with OPC at 300kgs.With 20mm and Down size granite metal coarse aggregate at 0.69cum and fine aggregate at 0.43cum Machne mixed, well compacted for wall and Bottom including centering shuttering,cost of materials,HOM of Machinery,Curing Etc.,Complete Excluding cost of Steel as per morth MORTH specification No. 1500, 1700, 2200. Including Cost of material, Labour, HOM complete as per Specification-WALL & Bottom thickness 15Cm.complete as per Specification and directions of the Engineer in charge	Cum	1139.51		
5	Providing T.M.T bars Fe 500 steel reinforcement for R.C.C work including straightening, cutting, bending, hooking, placing in position, lapping and / or welding wherever required, tying with binding wire and anchoring to the adjoining members wherever necessary complete as per design (laps, hooks and wastage shall not be measured and paid) cost of materials, labour, HOM of machinery. MORTH Specification NO.1600&2200 ,complete as per Specification and directions of the Engineer in charge	tonne	80.44		
6	Providing and Fixing pre cast covering Slab made out of CC 1:2:4 with 10cm thick and Finishing cutting ,including form work,curing,including cost of alll materials, labour,hire charges of machinery,loading,unloading,lead and lift,transportation etc ,copmplete. (Data Rate)complete as per Specification and directions of the Engineer in charge	Sqm	3159.90		

Item No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
7	Providing and Fixing pre cast covering Slab 250mm thick made out of CC 1:2:4 and jelly 20mm Down size with steel reinforcement including form work,curing,including cost of alll materials, labour,hire charges of machinery, loading, unloading, lead and lift,transportation etc ,complete as per Specification and directions of the Engineer in charge	Sqm	93.81		
8	. Scarifying bituminous course 50mm to 75mm thick along with premix carpet / surface dressing by road roller attached with scarifier without disturbing the base and stacking the debris including cost of all labour charges, HOM of machineries complete as per Specification and directions of the Engineer in charge	Sqm	3267.05		
9	. Excavation for roadwork in all types of soil by mechanical means including cutting and loading to tippers, trimming bottom and side slopes, in accordance with requirements of lines, grades and cross sections, and transportation with a lead of 1.00 km and complete as per specifications MORTH Specificatio MORTH Specification No.301Loading and unloading with 10km lead ,complete as per Specification and directions of the Engineer in charge	Cum	170.14		
10	Construction of granular sub-base Grading-V as Sub-base and drainage layer by providing coarse graded crushed stone aggregates of granite/ trap/basalt material, mixing in a mechanical mix plant at OMC, Carriage of mixed material to work site, spreading in uniform layers with motor grader on prepared surface and compacting with vibratory power roller to achieve the 98 % proctor density, complete as per Specification and directions of the Engineer in charge	Cum	490.06		
11	. Compaction of original ground by mechanical means including filling in depression occuring during rolling including cost of all labour, HOM complete as per Specification and directions of the Engineer in charge	Sqm	3267.05		
12	Providing, laying, spreading and compacting cushed stone aggregates of granite / trap / basalt to wet mix macadam specifications including pre mixing the material with water at OMC in mechanical mix plant carriage of mixed materials by tipper to site, laying in uniform layers with paver in sub-base/base course on well prepared surface and compacting with vibratory roller to achieve the desired densitycomplete as per Specification and directions of the Engineer in charge	Cum	921.56		
13	.Cleaning the existing WBM Road surface including removing of binding materials and other foreign matter with wire brushes and small picks sweeping with brooms or soft brushes and finally dusting with old gunny bags and bar or compressed air to receive bituminous treatment including cost of all materials, labhour, HOM of machineriescomplete as per Specification and directions of the Engineer in charge	Sqm	4006.80		

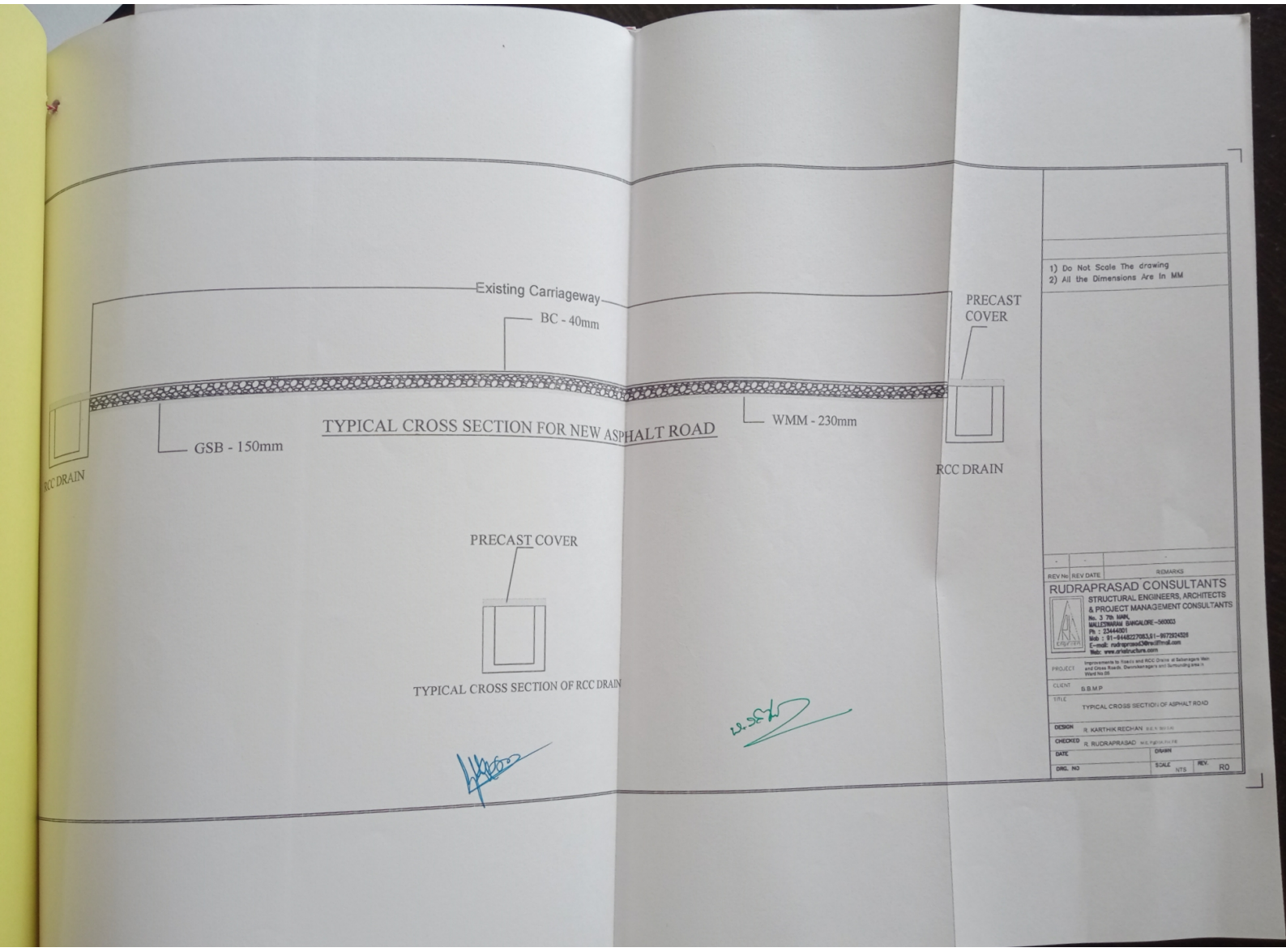
Item No	Description of Work	Unit	Total Quantity as per Estimation	Rate as per estimate in Rs.	
				In Figures	In Words
14	Providing and applying primer coat with S.S. bitumen emulsion on prepared surface of granular base such as WMM including cleaning of road surface and spraying primer at the rate of 0.60 kg / sqm using mechanical meanscomplete as per Specification and directions of the Engineer in charge	Sqm	4868.72		
15	. Providing and laying dense graded bituminous macadam using crushed aggregates of specified grading, premixed with VG30 grade bituminous binder and, transporting the hot mix to work site, laying to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications Clause 505 of MORTH V revisionusing 40/60 TPH capacity H.M.P. with Mechanical paver Gr-II (50 mm to 75 mm) with 4.5 % VG-30 Bitumen, complete as per Specification and directions of the Engineer in charge	Cum	244.64		
16	.Cleaning the existing black topped surface with brooms,soft brushes and finally dusting with old gunny bags and/or compressed air to receive bituminous treatment including cost of all materials,labhour, HOM of machineries complete as per Specification and directions of the Engineer in charge	Sqm	9013.15		
17	Providing and applying tack coat using 80/100 grade bitumen(VG10) on the prepared black topped surfaces at 2.5 kg per 10 sqm, heating bitumen in boiler fitted with spray set (excluding cleaning of road surface) including cost of all materials, labour, HOM complete as per Specification and directions of the Engineer in charge	Sqm	9013.15		
18	Providing and laying Bituminous Concrete 40 mm thick with hot mix plant, using crushed aggregates of specified grading, premixed with bituminous binder and filler, transporting the hot mix to work site, laying with a paver finisher to the required grade, level and alignment , rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction in all respects complete as per specifications.Clause 507 of MORTH V revision as per IRC SP-53-2015 - using 40-60 TPH capacity HMP with mechanical Paver, Gr-II (30-45mm) with 5.4 % of modified bitumen binder consisting of 4.97% VG- 30 bitumen (60/70 grade) 0.43% Plastomeric Thermoplastics (Waste plastic Additive) complete as per Specification and directions of the Engineer in charge	Cum	360.42		
19	Road Marking with Hot Applied Thermoplastic Compound with Reflectrising Glass Beads on Bituminous Surface/ Concrete Surface: Providing and laying of hot applied thermoplastic compound 2.5 mm thick including reflectorising glass beads at 250 gms per sqm area, thickness of 2.5 mm is exclusive of surface applied glass beads as per IRC:35 standards specified. The finished surface to be level, uniform and free from streaks and holes complete as per Specification and directions of the Engineer in charge	Sqm	336.30		

Executive Engineer,
BBMP
ಕಾರ್ಯ ಪಾಲಕ ಅಭಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ವಿಭಾಗ
ಬೃ.ಬೆ.ಮ.ಪಾ, ಬೆಂಗಳೂರು

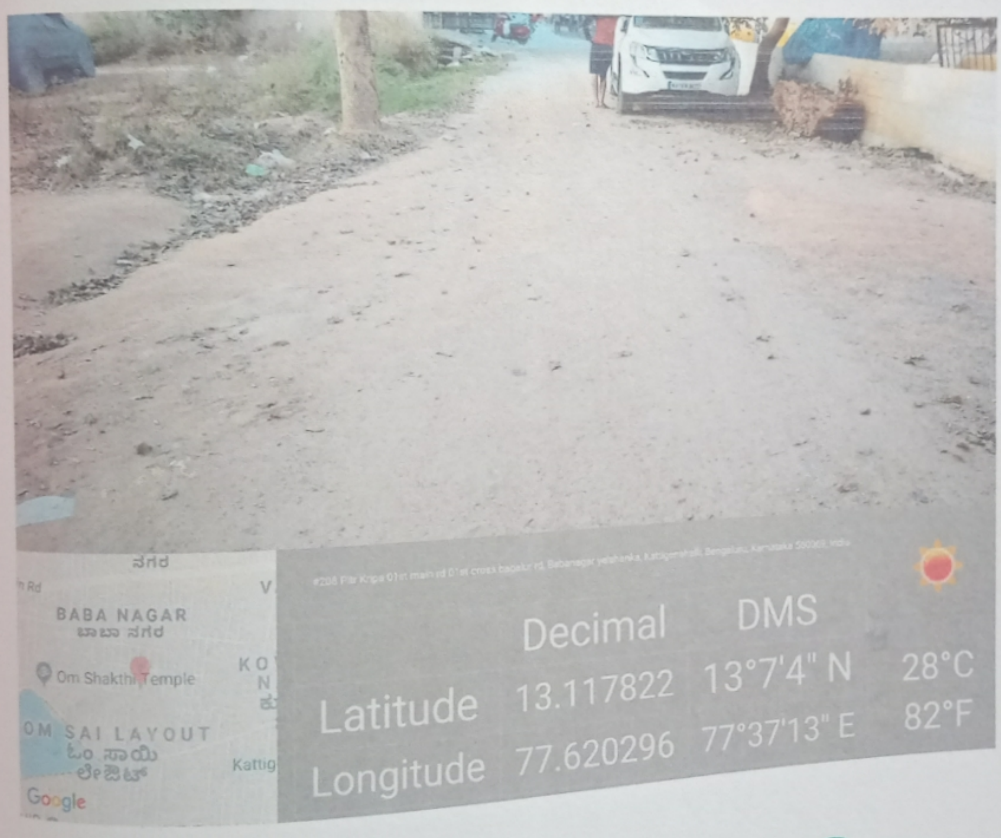
ANNEXURES



TYPICAL CROSS SECTION


Existing Carriageway
BC - 40mm
PRECAST COVER
WMM - 230mm
GSB - 150mm
RCC DRAIN
RCC DRAIN
TYPICAL CROSS SECTION FOR NEW ASPHALT ROAD
PRECAST COVER
TYPICAL CROSS SECTION OF RCC DRAIN
1) Do Not Scale The drawing
2) All the Dimensions Are In MM
REV No
REV DATE
REMARKS
RUDRAPRASAD CONSULTANTS
STRUCTURAL ENGINEERS, ARCHITECTS
& PROJECT MANAGEMENT CONSULTANTS
PROJECT
CLIENT
BBMP
TITLE
TYPICAL CROSS SECTION OF ASPHALT ROAD
DESIGN
R KARTHIK RECHAN
CHECKED
R RUDRAPRASAD
DATE
DRAWN
DWG. NO
SCALE
NTS
REV.
R0

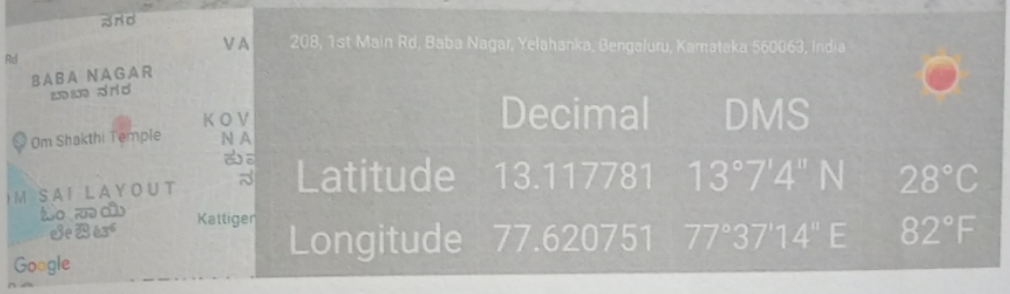
ROAD PHOTOGRAPHS



Rudraprasad Consultants
Structural Engineers, Architects &
Project management consultants

DWARKA NAGAR
BABA NAGAR
Om Shakthi Temple
OM SAI LAYOUT
2nd Main Rd, 3rd cross, Baba Nagar, Dwarka Nagar, Bengaluru, Karnataka 560064, India
Decimal DMS
Latitude 13.119453 13°7'10" N 28°C
Longitude 77.619594 77°37'10" E 82°F

BABA NAGAR
Om Shakthi Temple
Decimal DMS
Latitude 13.118488 13°7'6" N 28°C
Longitude 77.621062 77°37'15" E 82°F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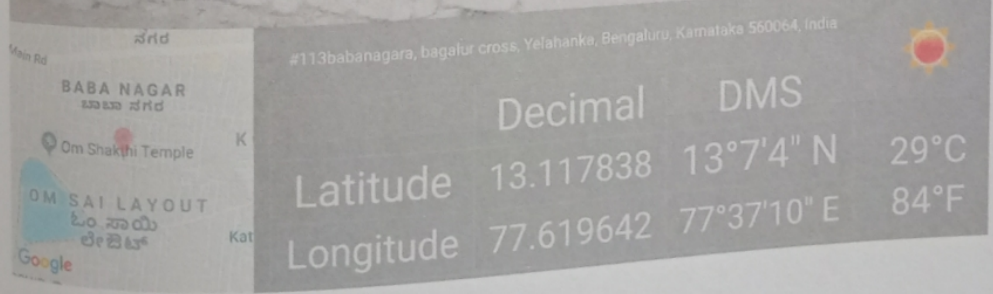
Om Shakthi Temple
SAI LAYOUT
Google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Om Shakthi Temple
SAI LAYOUT
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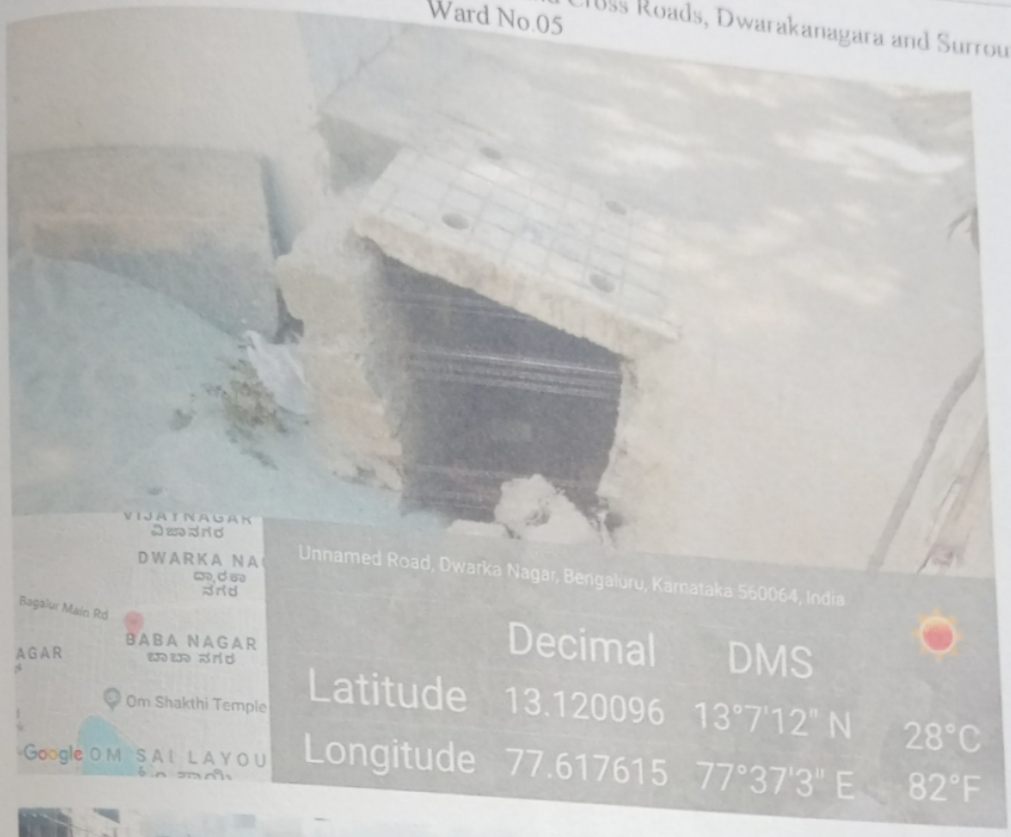
VIJAYNAGAR
DWARKA NA
Bagalur Main Rd
BABA NAGAR
Om Shakthi Temple
Google OM SAI LAYOU
Unnamed Road, Dwarka Nagar, Bengaluru, Karnataka 560064, India
Decimal DMS
Latitude 13.120096 13°7'12" N 28°C
Longitude 77.617615 77°37'3" E 82°F

DWARKA NA
Bagalur Main Rd
BABA NAGAR
Om Shakthi Temple
Google OM SAI LAYOU
Unnamed Road, Dwarka Nagar, Bengaluru, Karnataka 560064, India
Decimal DMS
Latitude 13.119164 13°7'8" N 28°C
Longitude 77.617739 77°37'3" E 82°F

VIJAYNAGA
DWARKA N
Bagalur Main Rd
BABA NAGA
NAGAR
Om Shakthi Tem
Google
OM SAI LAYO
Vinayakanagar 2th Main Rd, Vijaya Nagar, Kattigenahalli, Bengaluru, Karnataka 560064, India
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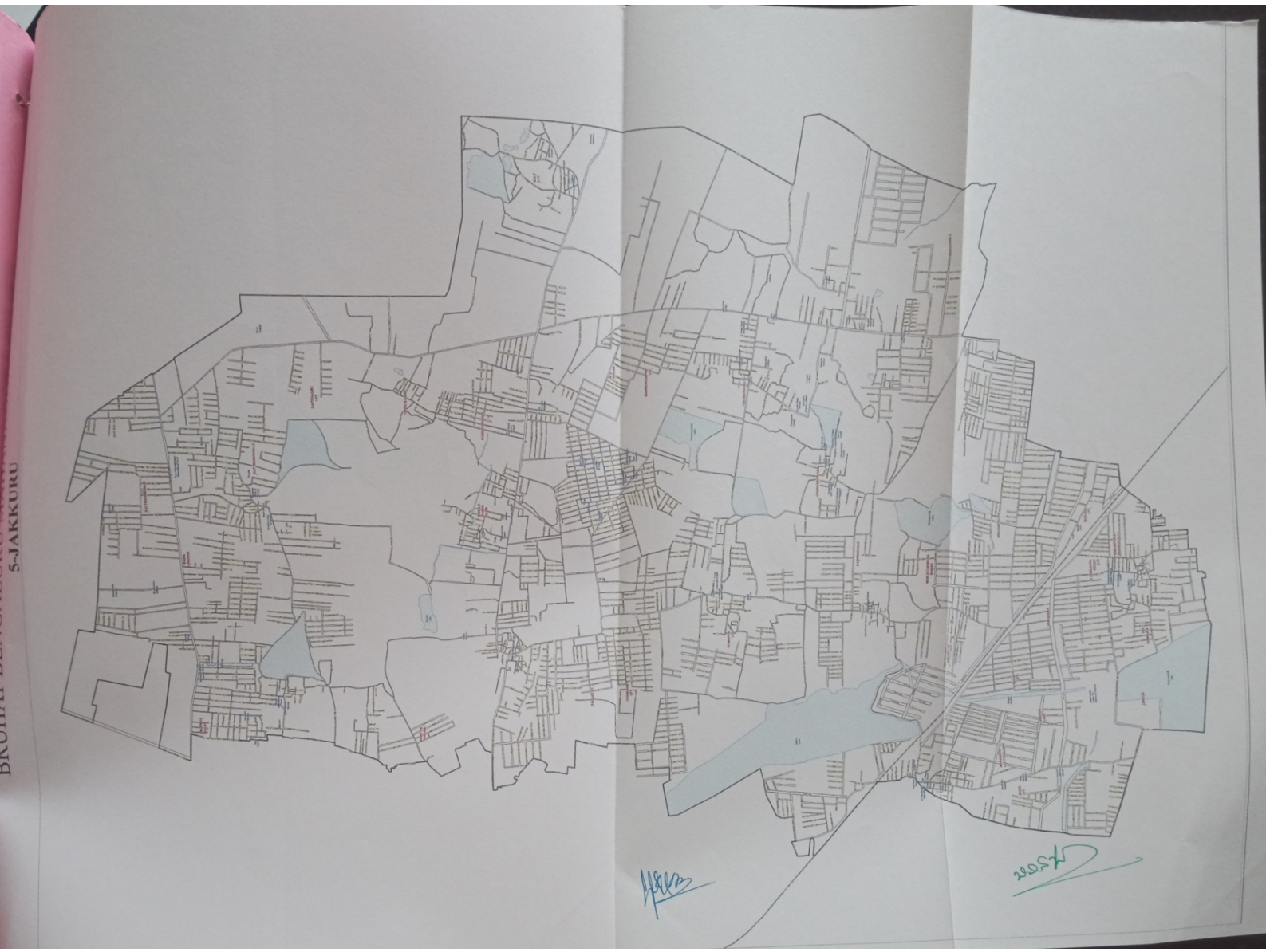
Latitude 13.120352 13°7'13" N 28°C
Longitude 77.616856 77°37'0" E 82°F

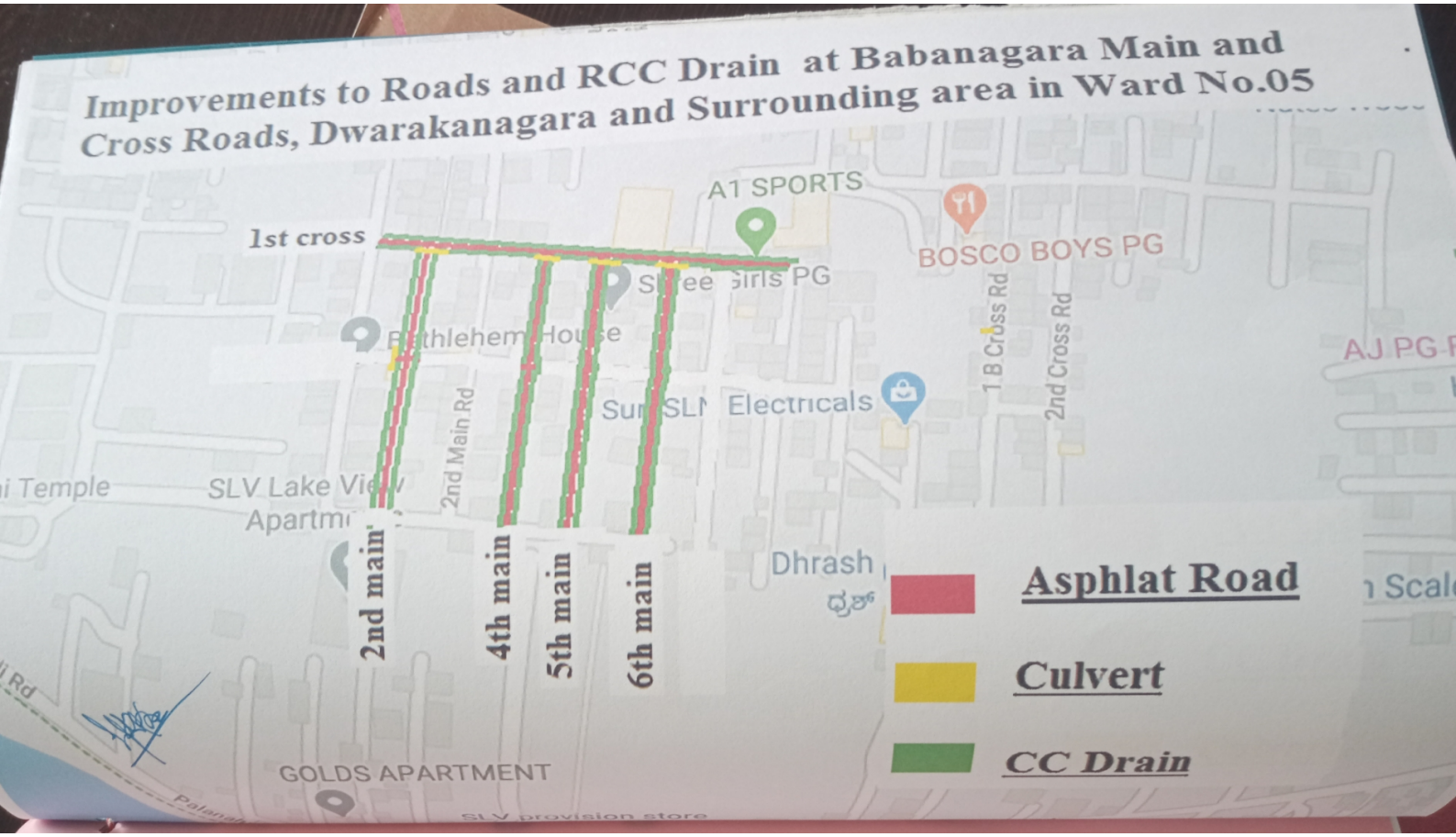
DWARKA
Bagalur Main Rd
NAGAR
BABA NAGA
Om Shakthi Tem
Google
OM SAI LAYO
H03, Defence Colony Vinayak Nagar, Kattigenahalli, Bengaluru, Karnataka 560064, India
Decimal DMS
Latitude 13.119362 13°7'9" N 28°C
Longitude 77.616696 77°37'0" E 82°F

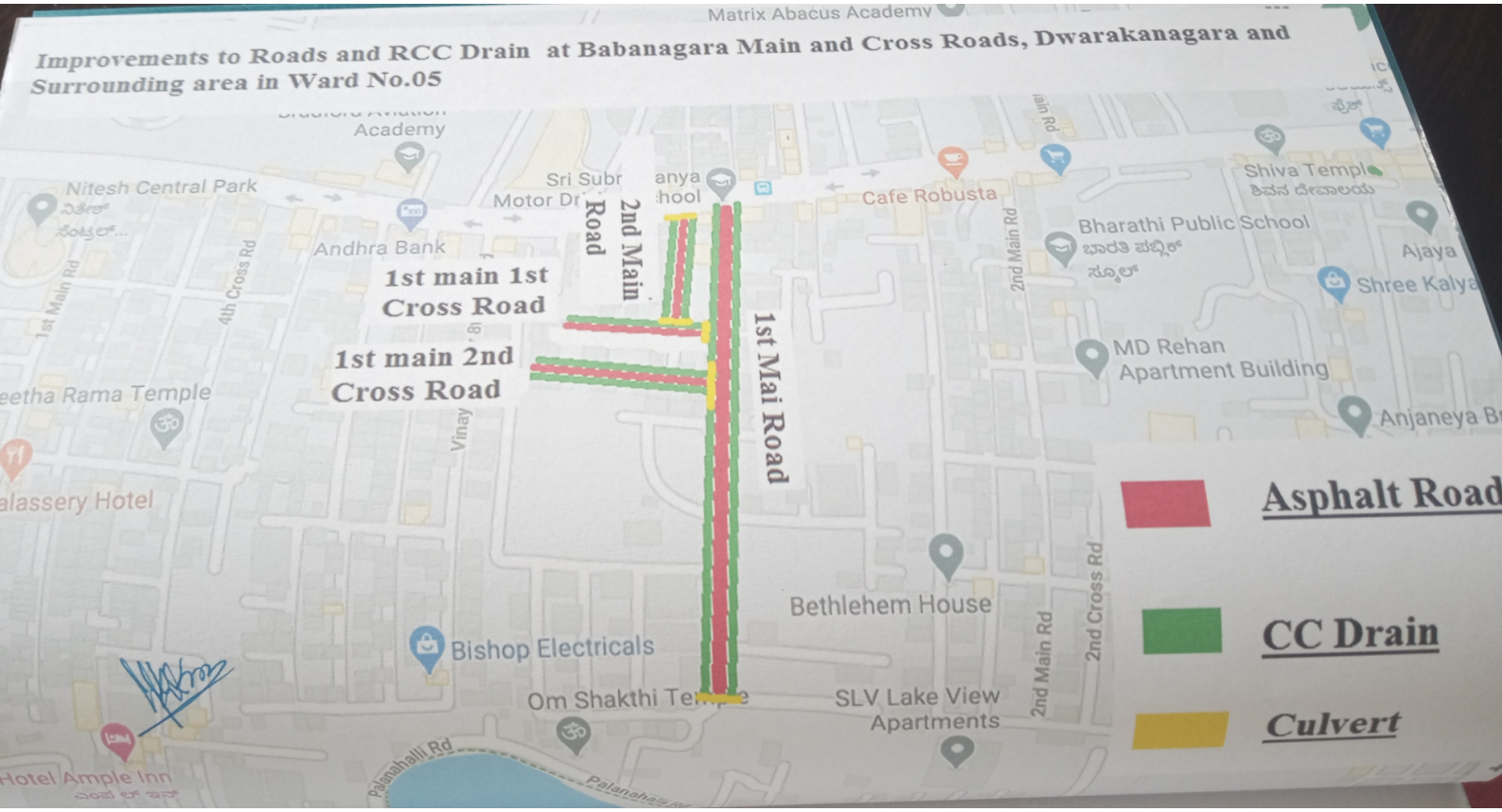
...Prasad Consultants
...Civil Engineers, Architects &
...project management consultants

WARD MAP


5-JAKKURU

KEY MAP


Improvements to Roads and RCC Drain at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05
A1 SPORTS
1st cross
BOSCO BOYS PG
1 B Cross Rd
2nd Cross Rd
2nd Main Rd
Electricals
SLV Lake View Apartm
Temple
2nd main
4th main
5th main
6th main
Dhrash
Asphlat Road
Culvert
CC Drain
GOLDS APARTMENT
AJ PG


Improvements to Roads and RCC Drain at Babanagara Main and Cross Roads, Dwarakanagara and Surrounding area in Ward No.05
Matrix Abacus Academy
Academy
Nitesh Central Park
Andhra Bank
Cafe Robusta
Shiva Temple
Bharathi Public School
Ajaya
Shree Kalya
MD Rehan Apartment Building
Anjaneya B
1st main 1st Cross Road
1st main 2nd Cross Road
2nd Main Road
1st Mai Road
1st Main Rd
4th Cross Rd
2nd Main Rd
2nd Cross Rd
Vinay
eetha Rama Temple
alassery Hotel
Bethlehem House
Bishop Electricals
Om Shakthi Te
SLV Lake View Apartments
Hotel Ample Inn
Palanahalli Rd
Asphalt Road
CC Drain
Culvert